allergens, rather than to a heightened capacity for IgE synthesis. The conditions which lead to specific IgE antibody synthesis remain obscure, but definition of the IgE class of immunoglobulin promises to aid research on this question.

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## The Use of Immune Serum Globulin (Gamma Globulin)

Immune serum globulin or pooled human gamma globulin (Cohn Fraction II) is of proved value in the prophylaxis of measles and infectious hepatitis and in the therapy and prophylaxis of infections in hypogammaglobulinemia. A dose of 0.02 ml per kg of body weight is usually sufficient for the prophylaxis of measles or infectious hepatitis.

Although the administration of immune serum globulin is of proved value in well-documented hypogammaglobulinemias, before recommending its use in borderline or mild hypogammaglobulinemia, a deficiency in antibody production should be clearly demonstrated. This can most readily be done by showing a lack of antibody response to two different antigens such as diphtheria and tetanus toxoids. Defective antibody production should also be demonstrated before immune serum globulin is given to patients with dysgammaglobulinemias unless very low levels of $\gamma G$ are present (less than 200 mg per 100 ml in young children or under 400 mg per 100 ml in older children and adults). The recommended dose for therapy and prophylaxis of antibody deficiency states is 1.5 ml per kg initially, followed by 0.66 ml per kg every 3 to 4 weeks.

Immune serum globulin may also be given (although its value has not clearly been shown) in an effort to prevent rubella in the first trimester of pregnancy, in the prevention of chicken pox in high risk patients such as children who are receiving steroid therapy or who have leukemia, and in the prophylaxis of serum hepatitis in high risk patients receiving blood transfusions. Patients at high risk for serum hepatitis include those with debilitating or chronic illnesses or anyone who receives blood or blood products strongly suspected or known to be infectious.

Hyperimmune serum globulins obtained from hyperimmunized or convalescing persons may be of use for specific diseases in which ordinary immune serum globulin is of doubtful value. They are available for mumps, pertussis, tetanus, and vaccinia. No prophylaxis is indicated for prepubertal children exposed to mumps, but mumps immune globulin may be used in exposed susceptible postpubertal males. Its value has not been well documented by controlled studies. The prompt administration of live attenuated mumps virus vaccine following exposure is preferable to giving mumps immune globulin.

Pertussis immune serum globulin may be used in doses of 1.5 ml in exposed infants under two years of age who have not been vaccinated. It may be repeated in five days if desired by the clinician.

Tetanus immune globulin should be used for unimmunized individuals with crushing injuries, burns, penetrating wounds and the like, in those who have had no tetanus toxoid injections for many years. Human tetanus immune globulin is given in a dose of 250 to 500 units intramuscularly. If human antitoxin is not available, equine tetanus antitoxin in a dose of 3,000 to 10,000 units may be given after testing for horse serum sensitivity. Human immune globulin is preferable in all instances in which it is obtainable.

Vaccinia immune globulin is useful in the prophylaxis and treatment of vaccinia of the eye, eczema vaccinatum, severe generalized vaccinia, or vaccinia necrosum. It may also be used in children who have extensive skin lesions including eczema, burns or impetigo and are accidentally exposed to vaccinia. Vaccinia immune globulin is not of value in the therapy of normal vaccination reactions and post vaccinal encephalitis, or for treatment of conditions such as chicken pox and herpes zoster. The prophylactic dose is 0.3 ml per kg of body weight.

There is no acceptable evidence that immune serum globulin is of value in the therapy of asthma or of recurrent infections not associated with documented hypogammaglobulinemia or a proved disorder in antibody production.

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